Summary and Recommendation

📊 Customer Churn Analysis Project

🔍 Project Overview

Customer churn is one of the biggest challenges for subscription-based businesses.
This project focuses on **analyzing customer behavior and identifying key factors that lead to churn** using data analysis and visualization techniques. The goal is to help businesses **reduce churn and improve customer retention strategies**.

📁 Dataset Description

The dataset contains customer-level information, including:

- **Demographics**: Gender, Senior Citizen
- **Account Information**: Tenure, Contract Type, Payment Method
- **Services Used**: Internet Service, Online Security, Tech Support, Streaming Services
- **Target Variable**: Churn (Yes / No)

🛠️ Tools & Technologies Used

- **Python**
- **Pandas & NumPy** – Data cleaning and manipulation
- **Matplotlib & Seaborn** – Data visualization
- **Jupyter Notebook** – Analysis and documentation

🧹 Data Cleaning & Preprocessing

- Replaced **missing and blank values** with appropriate defaults (e.g., `0` for Total Charges)

- Converted **binary values (0/1)** into meaningful labels (`Yes / No`)
- Checked for inconsistencies and cleaned categorical data
- Prepared data for analysis and visualization

📊 Exploratory Data Analysis (EDA)

The following analyses were performed:

- **Churn distribution** using pie and count plots
- **Senior Citizen vs Churn** comparison
- **Tenure analysis** using histograms
- **Contract type vs Churn**
- **Payment method vs Churn**
- **Service-based churn analysis** (Online Security, Tech Support, Streaming, etc.)

🔑 Key Insights

- 🔴 **26.54% of customers have churned**
- 👴 **Senior citizens show a higher churn rate** compared to younger customers
- ⏳ **Customers with shorter tenure (1–2 months)** are more likely to churn
- 📄 **Month-to-month contracts have the highest churn**
- 🛡️ Customers **without add-on services** like Online Security and Tech Support are more likely to leave
- 📉 Long-term customers are **more loyal and stable**

📈 Visualizations Included

- Count plots for categorical features
- Histogram for tenure distribution
- Pie chart for churn percentage
- Subplots for service-based churn comparison

🎯 Business Recommendations

- Encourage customers to switch from **monthly to yearly contracts**
- Offer **add-on services** as retention bundles
- Focus on **early-stage customers** with onboarding and engagement programs
- Design **special retention plans for senior citizens**

✅ Conclusion

This project demonstrates how **data-driven insights** can help businesses understand customer behavior and reduce churn. By targeting high-risk customers and improving service offerings, companies can significantly increase customer retention and revenue.
